V. DISEASES OF FRUIT CROPS

APPLE

ROT (Alternaria Mali) affected 15% of the Fameuse apples in a number of barrels in the storage cellar of the Station, Fredericton, N.B. The rot was severe (S. F. Clarkson). A. Mali was isolated from a core rot of apple from the Winnipeg market, Man. This is the first record in Man. (J. E. Machacek)

ROT (Botrytis cinerea) was severe on 1% of the Fameuse and Mc Intosh apples in storage at the Station, Fredericton, N.B.

CONIOSPORIUM SCAB (C. Mali) lightly infected the leaves in an orchard in Sunbury Co., N.B. The fungus was compared and considered identical with material kindly loaned by W. R. Foster (see Dearness, J. and W. R. Foster, Can. Jour. Res. 16, Sec. C:274-276. 1938). (S. F. Clarkson and A. G. Turney)

LEAF SPOT or SHOT HOLE (Coniothyrium pyrinum). A slight to medium infection was reported at Morden, Man.

TWIG BLIGHT (Cytospora sp.) affected up to 30 % of the twigs in some orchards of McIntosh and Fameuse in York and Queens counties, N.B. (S. F. Clarkson)

FIRE BLIGHT (Erwinia amylovora) caused slight damage to several varieties of crab apples in the University orchard, Saskatoon, Sask. Six orchards in the north-eastern section of the province were free from disease. A fire-blight specimen from a Rescue crab apple planted in 1938 was received from St. Hubert Mission (F. L. Drayton). Fire blight was generally severe at Morden, Man. Fire blight occurred on 2 trees of Yellow Transparent at Macdonald College, Que., and on various ornamentals at Lennoxville, where the disease was severe causing the death of some trees. A slight amount also occurred in the orchard at Ste. Anne de la Pocatiere. Disease specimens were received from Huberdeau. Fire blight was not observed in commercial orchards, but was common in abandoned plantings and on roadside trees in P.E.I.

HEART ROT (Fomes applantus). Sporophores were collected from trees of McIntosh slightly affected by a basal heart rot at Summerland, B.C. (F. Welsh and G. E. Woolliams)

CANKER. A young McIntosh tree was killed in Carleton Co., N.B., by a large canker; Fusarium sp. was fruiting on the canker. (S. F. Clarkson)

ROT (Fusarium sp.). Of the storage rots in Fameuse apples at the Station, Fredericton, N.B., 3% was due to Fusarium sp.

ROT (Gloeosporium album). Of the storage rot in apples of McIntosh, Northwest Greening, and Fameuse at the Station, Fredericton, N.B., 40% was caused by this pathogen. (S. F. Clarkson)

BITTER ROT (Glomerella cingulata). A few barrels of Fameuse were affected while in storage at the Station, Fredericton, N.B.; 15% of the fruit were decayed.

RUST (Gymnosporangium spp.) Apple rust (G. Juniperi-virginianae) caused considerably less damage than in 1939 in Essex Co., Ont., neither the fruit nor foliage being severely infected, although the galls on the red cedar were very abundant. The disease was observed on McIntosh, Wealthy, Delicious and other varieties (L. W. Koch). Leaves of Wealthy were badly disfigured by apple rust in an orchard near Trenton; no rust was found on other varieties in the same orchard (J. E. Howitt). The foliage of Wealthy was also heavily infected in an orchard near Brighton (H. Hill). Leaves col,ected by Wm. Ferguson (6706) were found affected by G. Juniperi-virginianae (I. L. Conners). From 1 to 2% of the fruit of McIntosh and Fameuse were affected in a 7-acre commercial orchard at the Illustration Station, Bloomfield (A. E. Barrett). Telia of G. Juniperi-virginianae were collected on red cedar at Trenton (5849) and near Picton, (5888). (I. L. Conners)

Rust affected 1.5% of the fruit of McIntosh, 3.4% of Cortland, a trace of Delicious and Fameuse in the Laboratory orchard, St. Catharines, Ont. This is the first occurrence of rust in the Laboratory orchard. (G. C. Chamberlain)

Quince rust (G. clavipes) was usually only a trace in the orchard, Ste. Anne de la Pocatiere, Que., but low percentages were recorded on a few varieties, such as 10% on Kelso and Linton, and 5% on Alexander.

TWIG BLIGHT (Nectria cinnabarina). A trace was found on Rome Beauty and Ben Davis in Kings Co., N.S. (J. F. Hockey)

ANTHRACNOSE (Neofabraea malicorticis) was fairly general in the Fraser Valley, B.C., but considerable damage occurred in a few small orchards, where control was not attempted. On Vancouver Island the disease is less prevalent, due, it is believed, to the growers paying more attention to its control.

ROT (Penicillium expansum). This rot comprised 35% of the rots present on McIntosh, Fameuse, and Northwest Greening in storage at the Station, Fredericton, N.B. (S. F. Clarkson) It was also recorded at Macdonald College, Que., and Charlottetown, P.E.I.

TWIG BLIGHT (Phomopsis sp.) is common on Fameuse and McIntosh in York, Westmorland, Queens and Carleton Counties, N.B.; a Phomopsis sp. is often associated with the trouble. (S. F. Clarkson)

LEAF SPOT (Phyllosticta sp.). A slight infection was observed in an orchard at Edmonton, Alta.

BLACK ROT (Physalospora obtusa) was severe on Crimson Beauty in an orchard at Lakeville Corner, N.B.; it caused a leaf spot, canker, and fruit rot. (S. F. Clarkson)

CROWN ROT (Phytophthora Cactorum) continues to be the most serious apple tree disease in the Okanagan Valley, B.C. Evidence is accumulating that most of the crown rot is due to P. Cactorum. (M. F. Welsh and R. F. Fitzpatrick)

POWDERY MILDEW (Podosphaera leucotricha) was general on Vancouver Island and the Lower Mainland, B.C.; it caused considerable damage in a few orchards on Vancouver Island, due undoubtedly to the dry season in 1940 (W. Jones). Powdery mildew was found in the southern Okanagan, mostly on McIntosh, Jonathan, Northern Spy, Yellow Newtown, and Yellow Transparent. It was quite general this year, and caused russetting on much of the unsprayed fruit. Where the trees were sprayed for mildew the disease was kept in check (G. E. Woolliams). Powdery mildew was general on unsprayed trees in Lincoln Co., Ont. It was prevalent on apple trees in York and Kent counties, N.B., especially on young McIntosh (S. F. Clarkson). Young trees were heavily infected in an orchard at Hamilton, P.E.I. This is the first report of powdery mildew on apple in P.E.I. (G. W. Ayers)

WOOD ROT (Schizophyllum commune). The fungus was fruiting on many stubs in the orchards at Brooks and Edmonton, Alta.; no apparent damage was caused. The fungus was present on a number of trees affected by black heart in York, Queens, Kent, and Charlotte counties, N.B.

SILVER LEAF (Stereum purpureum) affected one tree of Yellow Transparent at Macdonald College, Que. Up to 15% of the young trees were affected in some orchards in York and Queen counties, N.B.; a rot of the trunk was noted as well as leaf symptoms. (S. F. Clarkson)

SCAB (Venturia inaequalis) was general and caused moderate damage on the Lower Mainland, B.C. (W. Jones). Apple scab was virtually absent at Lavington, B.C.; it was easily controlled at Salmon Arm, but where spraying was neglected, it was quite prevalent and caused considerable loss. In experiments conducted this year, apple scab was effectively controlled with 3 spray applications - pink, calyx, and cover - of wettable sulphur, to which was added lime sulphur 1-100 in the pink and calyx sprays. A programme of this type will probably become standard practice in the district. (G. E. Woolliams)

Apple scab was extremely prevalent and destructive in unsprayed or poorly sprayed orchards in many parts of Ont. All the fruit was disfigured by scab on many of the susceptible varieties examined. In spite of the wet weather in the spring, scab did not appear until well on into

June, but from that time on it spread rapidly. In spite of favourable weather conditions for scab development, over 90% of the fruit was clean in thoroughly sprayed, well-cared-for orchards (J. E. Howitt). Apple scab was prevalent in the Niagara Peninsula; foliage infection was very heavy in most orchards, but the fruit was kept remarkably clean where the spraying was well done. On unsprayed trees, 100% of the fruit were infected, while on trees in sprayed blocks 12-25% were scabbed. The initial discharge of ascospores occurred on May 14, when the buds were at the pre-pink stage. Primary infection was first noted on June 3 and was probably due to ascospores liberated during the major period of discharge, May 18-20. Cool weather and slow growth at this time, when the buds were in the pink stage, probably favoured infection. Secondary infection was prevalent shortly after the calyx period, June 21. (G. C. Chamberlain)

Apple scab control was nearly perfect in well-sprayed orchards in western Que. in 1940, and contributed in a large measure to the rapid sale of McIntosh and Fameuse apples in the fall. On the other hand, all orchards imperfectly sprayed produced a crop mediocre in quality and poor in appearance. The perithecia of V. inaequalis were very numerous, but rather late in their development. At the green tip stage, May 10-15, only about 5% contained mature ascospores. On unsprayed trees primary infection was quite numerous, but it occurred later than usual, viz. June 8-10. With the occurrence of rain, scab spread rapidly covering nearly all the foliage and fruit, in some orchards; calyx infection was quite frequent. During July and August, further spread was slight, but in September and early October, numerous pin-head infections made their appearance (F. Godbout). Apple scab was first noted on July 2 on McIntosh, Lobo, and Crimson Beauty at Ste. Anne de la Pocatiere, Que. The disease was easily controlled in well-cared-for orchards. (C. Perrault)

Apple scab was better controlled than usual in well sprayed orchards in N.B. However, in orchards left unsprayed, or where the applications of spray were poorly timed, apple scab was severe on both leaves and fruits. Ascospores were present in the asci on May 11, but were not mature until May 23. Perithecia were less numerous than in former years. Initial discharge was moderate on May 25, when the buds were in the pink stage. Primary infection was observed on the leaves June 28, and was already severe on unsprayed trees on July 3. (S. F. Clarkson)

Scab was not serious in N.S. in 1940. Ascospores matured early and perithecia were liberating spores before the buds were sufficiently advanced to become infected. Heavy spore discharges occurred soon after the buds opened and again when they were in the pre-pink stage. No ascospores were found by the time the calyx spray was applied in most orchards. New infections appeared on May 25 and by June 22, unsprayed trees had about 30% of the foliage affected. Very little spread took place during the summer and not over 75% of the fruit on unsprayed trees of McIntosh were scabby by harvest. On many other varieties, only 15-25% of the fruit became affected. Good commercial control of scab was obtained by 3-4 spray applications. (J. F. Hockey)

Traces only of scab were present in sprayed orchards, but it was severe in most of the smaller orchards. Ascospore discharge was late (June 4) and not very abundant at any time, yet primary infection was observed on June 12. (R. R. Hurst)

MOSAIC (virus) was definitely transmitted from a single Delicious tree, previously reported affected, to two young trees, one of Delicious and the other McIntosh at the Station, Summerland, B.C. Mosaic has not been observed on any other trees (T. B. Lott). A well defined mosaic was found on 100% of Wealthy trees and 45% of the Wolf River, in an orchard near Woodstock, N.B., and on all the Bethel at the Station, Fredericton (D. J. MacLeod). Many new reports of affected trees in N.S. have been received. Some roguing has been carried out in old orchards and private nurseries. Mosaic does not seem to seriously depress the yield. (J. F. Hockey) One McIntosh tree in a nursery row showed mosaic in P.E.I. (R. R. Hurst)

FALSE STING (virus) was found affecting a few trees in N.S.; the affected varieties were Gravenstein, Baldwin, Ben Davis, Northern Spy, Talman Sweet and McIntosh. It was recently shown to be a virus disease (Sci. Agr. 21:242-243. 1940). (J. F. Hockey)

BITTER PIT (non-parasitic). Serious losses from bitter pit were incurred by some growers in the Okanagan district, B.C. While these losses may be attributable in part to picking immature fruit and lightness of crop, there seems little doubt that climatic conditions favoured the disease this year, for even in the very resistant variety, McIntosh, instances of bitter pit were found (H. R. McLarty and R. E. Fitzpatrick). Bitter pit was found in one Baldwin tree in the Laboratory orchard, St. Catharines, Ont., 1% of the fruit being pitted. In 1939, it occurred on 9 out of 10 trees and 2-12% of the fruit were pitted. Northern Spy and Delicious were free from the trouble, although they were affected last year (G. C. Chamberlain). Bitter pit was less generally reported than usual in Ont. (H. Hill)

Sample lots of 400 Stark fruit per tree, picked Oct. 12 from 11 of the 14 orchards under survey, showed 0-5% of the fruit affected by bitter pit, an average of 1.12% for the 11 orchards. No bitter pit was detected on Stark in mid-September. It was reported in Gravenstein on Aug. 30. (R. Baylis and J. W. McLellan)

BLACK HEART (frost). McIntosh trees injured during the winter 1933-34 in N.B. showed black heart. (S. F. Clarkson)

DIE-BACK was rather severe on several trees of Schiawasse Beauty at the Station, Charlottetown, P.E.I.; according to J. F. Hockey the trouble was due to unfavourable growth conditions in 1939. (R. R. Hurst)

DROUGHT SPOT, CORKY CORE and DIE BACK (boron deficiency). There have been no commercial losses since soil applications of boric acid were adopted as the means of control in the Okanagan Valley, B.C. Treatment of the soil every 3 years at the rate of 30 lb. of boric acid per acre is the present recommendation (H. R. McLarty and R. E. Fitzpatrick). Drought spot caused slight damage in a small orchard at Sooke; the growing season was dry. (W. Newton)

In general, drought spot or superficial cork was much less prevalent in Northumberland, Durham, and Prince Edward counties, Ont., than usual. In the check plots of the experimental orchard near Brighton, where ordinarily drought spot affects 50% of the fruit, only 2% were affected this year. These observations are supported by the fact that very few samples of the trouble were received. (H. Hill)

A few barrels of Cortland apples were affected by internal cork at harvest time in a commercial orchard at Debec, N.B. (S. F. Clarkson)

FERTILIZER INJURY. About 100 young apple trees were set out this spring in an orchard in Northumberland Co., N.B., and received 7½ lb. of 4-8-10 fertilizer. Due to excessive rainfall during the summer most of the fertilizer was made available to the trees and resulted in their death. (S. F. Clarkson)

LEAF CURL (frost). About 5% of the first leaves formed in several orchard districts in N.B., were curled due to frost. The mid-rib was curled and the outer margin was destroyed. (S. F. Clarkson)

LEAF SCORCH (cause unknown). A mid-summer scorching of the marginal and interveinal parts of mature leaves caused serious defoliation in a number of orchards in the Okanagan Valley, B.C. It was particularly severe on Newton and McIntosh. (R. E. Fitzpatrick and H. R. McLarty)

SPRAY INJURY. Due largely to the unusual weather conditions, copper burn was quite general on apple foliage in some orchards, particularly in Durham and Northumberland counties, Ont. In one orchard in the Niagara Peninsula, where the grower failed to add the lime in the making of Bordeaux mixture, the trees were nearly defoliated and the apples were badly marked and darkened. (G. H. Berkeley)

Russetting was very general and caused severe damage in many orchards in N.B., where Bordeaux was used in the pre-pink and calyx sprays. Some growers sold their fruit on a tree-run basis (S. F. Clarkson). In the Annapolis Valley, N.S., in orchards planted to mixed varieties, Bordeaux sprays are recommended for the delayed dormant and pre-pink sprays, followed by 3 sulphur applications. On varieties, particularly susceptible to russetting, it may be necessary to avoid the use of copper altogether. In 1940 considerable russetting resulted from the application of Bordeaux as a pre-pink spray. Severe russetting and cracking were present on Cox Orange sprayed with sulphur and lead arsenate. The iron-sulphate lime-sulphur with

calcium arsenate gave the best finish to Cox Orange. Russetting is closely associated with high humidity, but under Nova Scotia conditions, the present schedules have been found to give the least injury with adequate control of scab. (J. F. Hockey)

WATER CORE (non-parasitic) was moderate on King in October at the Station, Sidney, B.C.

APRICOT

POWDERY MILDEW (Podosphaera Oxyacanthae) was heavy on a seedling tree in a garden at Summerland, B.C. (R. E. Fitzpatrick)

DIE-BACK (boron deficiency). Several young orchards, which had not been treated with boric acid, came down with a serious die-back this spring at Peachland and Summerland, B.C. In one orchard 27 trees were affected out of 44. (R. E. Fitzpatrick)

FRUIT SPOT (cause unknown). False "drought spot" continues to be the only serious fruit spot of apricot in the Okanagan Valley, B.C. There are four fruit blemishes of apricot in B.C. (1) Drought Spot (boron deficiency) has been encountered once or twice. The symptoms are not the usual ones associated with drought spot. They have, however, been described by Aaken, H. O. and W. R. L. Williams (N.Z. Jour. Sci. & Tech. 20:103a-106a. 1939). (2) False "Drought Spot". The cause is unknown except it is not due to a fungus. (3) Coryneum Spot (C. Beijerinckii) occurs in the Kootenays, but not in the Okanagan. (4) Powdery Mildew (Podosphaera Oxyacanthae) spot or blemish is very uncommon and never of economic importance. (R. E. Fitzpatrick)

BLUEBERRY

RUST (Calyptospora Goeppertiana). A light infection was observed at Tusket, N.S. (G. W. Hope)

POWDERY MILDEW (Microsphaera Alni var. Vaccinii) was light at Wedgeport, N.S. on Sept. 5. (G. W. Hope)

BOYSENBERRY

LEAF SPOT (Septoria Rubi) was general and caused slight damage at the Station, Sidney, B.C.

MOSAIC (virus) affected up to 20% of the plants in a planting at Hatzic, and a few plants at the Station, Sidney, B.C. (W. Jones)

CHERRY

BLACK KNOT (Dibotryon morbosum). Traces were present in all orchards of sour cherries in P.E.I.; it was widespread and destructive on wild species. (R. R. Hurst)

SHOT HOLE (Higginsia hiemalis (Cylindrosporium hiemale) was severe on Republican in North Vancouver, B.C.; it was slight at the Station, Sidney, B.C. (W. Jones). Shot hole was present in epidemic form in Lincoln and Welland counties, Ont. The leaves became conspicuously infected early in the season and considerable leaf fall occurred before the fruit was ripe. All cherry orchards were affected to a more or less extent, some being defoliated early in the fall. The disease was more serious on sour varieties, but it was also present on the sweet (G. C. Chamberlain). Shot hole was very prevalent throughout Ontario this year. It was particularly destructive to sour cherries, many trees of which were almost completely defoliated by picking time (J. E. Howitt). A few trees were severely affected at Ste. Anne de la Pocatiere, Que. (L. J. S. Laporte). Shot hole was not serious this year in P.E.I.; infection was a trace to heavy on sour cherries and a trace on sweet. (R. R. Hurst)

Shot hole (Higginsia lutescens (Cylindrosporium lutescens) moderately affected cultivated sweet choke cherry at Brandon, Man.

POWDERY MILDEW (Podosphaera Oxyacanthae). A light infection was found on a few trees at Oliver and Osoyoos, B.C. No perithecia were present (T. B. Lott). A moderate infection was present on cultivated sweet choke cherry at Brandon, Man. This is the first record of powdery mildew on P. virginiana in Man.

BROWN ROT (Sclerotinia americana) slightly infected sour cherries, but none was present on sweet varieties at the Station, Sidney, B.C. (J. Maxwell). A few days of continuous foggy weather, very favourable for blossom blight, occurred while sour cherries were in full bloom and sweet varieties were just past that stage in Lincoln Co., Ont. From 5 to 25% of the blossoms were blighted. A special blossom spray was advised. Brown rot destroyed 5-25% of the fruit of sweet cherries in orchards in Lincoln Co.; where the spraying was not thorough or the full number of late applications was not made, infection was even more. (G. C. Chamberlain)

BLOSSOM BLIGHT (Sclerotinia cinerea) moderately affected sour cherries at the Station, Sidney, B.C., while sweet cherries were clean. A very slight amount of blight occurred in the Fraser Valley. (J. Maxwell and W. Jones)

LAMBERT MOTTLE (suspected to be virus) was severe on 3 trees, moderate on 3 and slight on one of the Lambert variety in the southern Okanagan, B.C. The survey covered 3,018 cherry trees, chiefly in the Osoyoos district. This may be the expression of mottle leaf or mild mottle in the Lambert variety. (T. B. Lott)

MILD MOTTLE (virus) was moderate in 2 and slight in 3 trees in the southern Okanagan, B.C. The symptoms are similar to those of mottle leaf, but it appeared to have little effect on the yield. (T. B. Lott)

MOTTLE LEAF (virus) affected 6 Bing, 3 Royal Anne (Napoleon), 1 Black Republican, 4 unknown, and 0 Lambert trees at Nelson City, B.C.; on the survey a single diseased Bing tree was found.

RING SPOT (probably virus) was found affecting one tree in Lincoln Co., Ont. (R. S. Willison)

TWISTED LEAF (virus). Only one additional tree was seen during the survey in B.C. Most affected trees are Bing. The disease has been transmitted to 5 young trees. The symptoms are: many leaves bilaterally unequal, portions of veins and petioles necrotic, leaf blades and petioles abruptly kinked, twisted sometimes into a spiral. (T. B. Lott)

CRINKLE (probably a mutation) was found affecting 120 Bing trees (48 completely); 10 Black Tartarian (2 completely); and 13 of unknown varieties (5 completely), a total of 143 trees in the southern Okanagan, B.C. (T. B. Lott)

FALSE SHOT HOLE (non-parasitic) was moderate on 11, slight on 20 and a trace on 12 out of 3,018 trees surveyed in the southern Okanagan, B.C. Scions from a tree that has been severely affected for 3 years, made normal growth when placed on a healthy young tree. (T. B. Lott)

INTERVEINAL MOTTLE (non-parasitic) was severe on 1 tree, moderate on 16, slight on 26, trace on 18 in the same survey. Usually the trouble is unimportant. (T. B. Lott)

LITTLE CHERRY (cause unknown) is general in an area about 35 miles long, embracing Nelson, Willow Point, and Sunshine Bay, B.C. It is causing a reduction of about 5,000 crates at the present time. Little cherry was first observed at Willow Point by H. R. McLarty in 1934 and has since been spreading slowly. Most fruits fail to reach normal size and remain red and low in sugar. It has not yet been found in the Okanagan Valley. (T. B. Lott)

RING SPOT MOTTLE (cause unknown) was found to be moderate on 7 trees, slight on 20, and a trace on 21, in the survey this year. It is usually associated with a heavy soil and excess water, but the presence of a virus is not entirely ruled out. (T. B. Lott)

SHOT HOLE (cause unknown) was moderate to severe on several Prunus hybrids and slightly affected other cherries and plums in the orchards at Lacombe, Alta. No evidence of fungus infection was found. (M. W. Cormack)

SPRAY INJURY from lime sulphur was moderate to severe on sweet cherries in Lincoln Co., Ont. It was probably associated with the wet conditions, slow drying of the spray, and succulence of the growth. (G. C. Chamberlain)

YELLOW LEAF occurred in numerous orchards in Lincoln Co., Ont. In some it could be associated with spray injury from repeated applications of Bordeaux or from Bordeaux alternated with lime sulphur. In other cases it seemed to be of a physiological nature. (G. C. Chamberlain)

CRANBERRY

LEAF SPOT (Gibbera compacta). Leaves slightly infected were received from Digby Co., N.S. (J. F. Hockey)

CURRANT

WHITE PINE BLISTER RUST (Cronartium ribicola). Complaints were received from many parts of Ont. that the rust was disfiguring the leaves of black currants. An examination of some of the plantings revealed that nearly all the leaves were heavily infected by rust and in some cases the bushes were completely defoliated early in September. It is probable that the same bushes were also attacked by Anthracnose and Septoria Leaf Spot (J. E. Howitt). In the currant plantation, Division of Horticulture, Central Experimental Farm, Ottawa, most susceptible varieties of black currants were considerably affected and susceptible varieties of red and white currants were slightly affected; no rust was seen on the gooseberry varieties. Rust was first recorded on black currants on June 27, and reached its maximum on July 18. The bushes were sprayed as in previous years with Bordeaux, the dates being May 7, May 18, and June 10 (H. J. Read). A study of the records for the past six years show that the rust was definitely more prevalent in 1940 than in any year since the present spray programme was started, but this may be accounted for by the rather cool wet spring and early summer.

The plantation of black currants on the Island of Orleans, Que., which was found badly rusted in 1939 (P.D.S. 19:86) was again heavily infected this year. The rust first appeared along the northern edge of the plantation near the woods. The rust developed more slowly this year than in 1939, but by Sept. 15 the foliage was covered almost throughout the plantation and became still heavier at the close of the season (O. Caron). White pine blister rust was heavy on black currants in N.B. and caused defoliation in some plantations in August (S. F. Clarkson). Infection was heavy in many gardens in P.E.I., both red and black currants being infected. (R. R. Hurst)

ANTHRACNOSE (Drepanopeziza Ribis (Gloeosporium Ribis). Infection was slight at Beaver Lodge, Alta., and severe on Red Lake and Minn 52., varieties of red currants, at Morden, Man.

SEPTORIA LEAF SPOT (Mycosphaerella Ribis (Septoria Ribis) was slight in a planting at Edmonton and moderate in one at Lacombe, Alta.

POWDERY MILDEW (Sphaerotheca mors-uvae) was severe on Climax, moderate on Boskoop Giant, Magnus and White Grape, while Fay Prolific was clean at the Station, Summerland, B.C. It was slight to moderate in the University orchard, Edmonton, Alta., and general but slight at Morden, Man.

GOOSEBERRY

RUST (Puccinia Pringsheimiana) moderately infected and partially defoliated several bushes at the Station, Kentville, N.S.

POWDERY MILDEW (Sphaerotheca mors-uvae) was present in the variety plots, Summerland, B.C. It was severe on Oregon Champion and Poorman, while Pixwell and Newton were clean. A slight infection was general at Morden, Man.; it does not appear to have been previously recorded in Man. on gooseberry (W. L. Gordon). Powdery mildew was recorded only on a few berries in P.E.I.

GRAPE

CROWN GALL (Phytomonas tumefaciens) was rather severe on a single vine for several feet above ground level about an extensive injury in a vineyard in Lincoln Co., Ont. (G. C. Chamberlain)

POWDERY MILDEW (Uncinula necator) was slight at the Station, Sidney, B.C. in October. The disease occurred commonly in Lincoln Co., Ont., but it was not as serious as downy mildew. Powdery mildew was rare at Macdonald College, Que.

DOWNY MILDEW (Plasmopara viticola). A very severe outbreak occurred in a 100-acre vineyard of Agawan in Lincoln Co., Ont. The disease was favoured by the heavy growth and excessively wet weather. No pre-blossom spray was applied, and it was thought that the Bordeaux had been applied late. In another vineyard, 75% of the fruit clusters of Fredonia were destroyed, infection apparently occurring previous to bloom, as many clusters failed to develop berries. It was also severe on Agawan, but Campbell's Early was free from infection. A moderate infection on the foliage was noted on Deleware in another vineyard (G. C. Chamberlain). A slight infection was found in a vineyard on Isle Bizard, Que. (E. Lavallee)

LOGANBERRY

DRY BERRY (Haplosphaeria deformans) was widely distributed on the Lower Mainland and Vancouver Island, it caused up to 30% loss of fruit. (W. Jones)

SEPTORIA LEAF SPOT (S. Rubi) was general and caused slight damage near Sidney, B.C.

PEACH

SCAB (Cladosporium carpophilum) caused moderate damage to Early Elberta in the Olinda district, but not elsewhere in Essex Co., Ont. (L. W. Koch)

BLIGHT (Coryneum Beijerinckii) caused severe damage in a large orchard in the Creston district, B.C., as a fruit spot, twig blight, branch canker with gummosis. A slight infection also occurred in 3 other orchards in the district. (W. R. Foster)

DRY ROT. Sporophores of Fomes pinicola and Polyporus hirsutus were collected by H. R. McLarty from trees suffering from a basal dry rot at Oliver, B.C. (G. E. Woolliams)

BACTERIAL SPOT (Phytomonas pruni). About 75% of fruit were more or less severely affected in a block of 550 trees of Burbank Crawford in an orchard at Port Burwell, Ont., but the leaves were apparently only lightly infected. Valiant, Eclipse, Globe, and Elberta were affected, but to much less extent, while South Hanen and Hale's Hanen were free from infection. Bacterial spot also occurred in an orchard at Port Dalhousie. Both orchards are located near the lake shore and were subject to increased dampness from fogs, etc., which would favour disease development. (G. C. Chamberlain)

BLOSSOM BLIGHT (Sclerotinia americana). On account of the wet weather during the blooming period, blossom blight was prevalent in peach orchards in the Niagara Peninsula, Ont., and increased the inoculum necessary for the development later of brown rot and added to the difficulty in the control of the latter. (R. S. Willison)

BROWN ROT (Sclerotinia americana) was serious in the orchard as well as in harvested fruit in the Niagara district, Ont., especially in early varieties, which ripened later than usual due to the cool wet weather prevailing in July and August. Considerable damage was done to twigs and small branches by the rotting of fruit on the tree. When spraying was done thoroughly and a full summer schedule was employed, it reduced the incidence of rot materially, but it did not give complete control. Control was made more difficult by an outbreak of blossom blight (q.v.) and the rotting of green fruit mostly at curculio and fruit moth punctures. Late varieties,

such as Elberta, suffered little damage in the orchard as weather was more favourable during their harvesting, but the incidence of rot in the harvested fruit was higher than usual. (R. S. Willison)

POWDERY MILDEW (Sphaerotheca pannosa) was quite prevalent in several orchards at Peachland, East Kelowna, and Summerland, B.C.; ordinarily infection is only slight (G. E. Woolliams). Scattered infection on the fruit was noted in an orchard in Lincoln Co., Ont.

LEAF CURL (Taphrina deformans). In general, infection was low in the Niagara Peninsula, Ont.; except when the disease is epidemic, it is of little consequence as the use of dormant sprays is almost universal (R. S. Willison). Leaf curl almost completely defoliated many unsprayed peach trees throughout Ont. this year (J. E. Howitt). The disease was heavy on young unsprayed trees at Avonport, N.S. (K. A. Harrison)

WILT (Verticillium sp.). Scattered trees affected by wilt were encountered in several young orchards in Lincoln Co., Ont. The cool, wet spring appeared to favour development. The occurrence of the wilt was associated with growing tomatoes on the same soil in recent years or as an intercrop. (G. C. Chamberlain)

MOSAIC (virus) was suspected in one tree in a 3-year-old orchard block in Wentworth Co., Ont.; the leaves showed peculiar angular spots and blotches, while some were puckered and the margins torn. (R. S. Willison)

PRUNE MOSAIC (virus) was transmitted from Italian Prune to peach by budding at the Laboratory, St. Catharines, Ont. It produces on peach a shortening of the internodes and a general dwarfing; some leaves show patterns (lines and rings). It has been observed in nature only on Italian prune, top worked on Damson plum. (R. S. Willison)

YELLOWS and LITTLE PEACH (virus). In the "control zone" in the Niagara Peninsula, Ont., there appears to be a very low incidence this year where rigid inspection and roguing were conducted in former years. (R. S. Willison)

A suspected virus disease was found affecting peach trees in the Okanagan valley, B.C. It is mostly concentrated in the southern Okanagan, where 121 affected trees were found among 7,086 examined, while only 2 were affected out of 8,456 examined in the central Okanagan and no disease was found in the Similkameen valley, where 1,402 trees were examined. The symptoms first appear in July or August as a yellowish mottle of the leaves on scattered twigs or branches of the affected tree, while adjacent parts apparently remain normal. The leaves soon show water-soaked areas, with a mixture of green, olive, yellow, red and purple colours. Brown papery spots develop and fall out. Defoliation of the shoots begins at the base and is often complete. Most fruits are small and drop prematurely. Dead twigs and branches occur in the second year. Trees probably become worth-

less in one or two years. A single diseased tree was found in 1939 out of 247 examined. In 1940, 8 additional diseased trees were found and the original tree was much more severely diseased. It is believed that all the diseased trees found this year were showing the symptoms for the first time. Growers have been made acquainted with the symptoms and advised to remove all affected trees, since they become useless in a year or two. (T. B. Lott)

FALL SPRAY INJURY. Lime sulphur injury was observed in orchards in the Niagara Peninsula as widely separated as Bartonville, Port Dalhousie and Stamford, where late November spraying was practised. In the Laboratory orchard, St. Catharines, peaches sprayed with lime sulphur 1:8 or lime sulphur 1:15, 3-6-40 Bordeaux or 3% oil in 3-6-40 Bordeaux on Nov. 1, 1939 showed little or no injury in the spring of 1940. On the other hand trees sprayed 3 weeks later, particularly young ones, were severely damaged by the lime sulphur sprays, but not by the Bordeaux or the Bordeaux-oil emulsion. The lack of injury from the Nov. 1st spray was attributed to the presence of leaves on the trees when they were sprayed. At the later date, leaf fall was almost complete, and leaf scars had protective layers in the early stages of development only and were thus easily penetrated by the spray material. (R. S. Willison)

INSECTICIDE INJURY. Several cases of killing of peach trees were investigated in Norfolk and Lincoln counties, Ont., where paradichlorobenzene was used to treat the trees for peach borer. In all cases the paradichlorobenzene was left around the trees all winter, and in one case the dosage was not carefully regulated. (G. H. Berkeley)

SUTURE SPOT (probably physiological), first reported and described in 1939 (P.D.S. 19:89), was prevalent this year in many orchards of the Beamsville-Grimsby and the Fonthill-Ridgeville areas. It was observed on Elberta towards the end of the harvest period. The trouble is in the nature of a breakdown highly restricted to location and extent of the affected tissue. Considerable variation in the number of fruits affected does occur. (R. S. Willison)

PEAR

FIRE BLIGHT (Erwinia amylovora). Very little blight was found in the Okanagan Valley, B.C. The eradication and inspection campaign conducted by the Provincial Department of Agriculture has kept the disease under control (G. E. Woolliams). Numerous hold-over cankers resulted in poor growth on Kieffer pears in an orchard in Lincoln Co., Ont.; some twig blight was also present. (G. C. Chamberlain)

POWDERY MILDEW (Podosphaera leucotricha) was quite general in the southern Okanagan Valley, B.C.; much of the fruit was reduced in grade due to blemish. Most orchards were not sprayed for powdery mildew, but where this was done, the disease was controlled satisfactorily. (G. E. Woolliams)

SCAB (Venturia pyrina) was negligible on all varieties at the Station, Sidney, B.C., except Anjou, which suffered moderate damage (W. Jones). Scab was severe on unsprayed trees in several counties in N.B. Scab was heavy on Flemish Beauty in an orchard in Queens Co., P.E.I., although it had been sprayed. (R. R. Hurst)

STONY PIT (virus) was moderate on the Bosc variety at the Station, Sidney, B.C., while Bartlett and Jules Guiot were almost free. (W. Jones)

BLACK END (cause unknown) was serious in some orchards in the Okanagan Valley, B.C., and was present to some extent in almost all orchards, particularly on Bartlett. (R. E. Fitzpatrick)

DROUGHT SPOT (boron deficiency). There were no commercial losses this year in the Okanagan valley, B.C., as most pear orchards have been treated with boric acid. (H. R. McLarty and R. E. Fitzpatrick)

PLUM

BLACK KNOT (Dibotryon morbosum) was very severe on unsprayed trees throughout N.B. The disease is severe in all uncared-for orchards in P.E.I. Young trees not yet bearing have been killed within two years from first becoming infected. (R. R. Hurst)

SHOT HOLE (Higginsia prunophorae) caused slight to severe damage throughout N.B. (S. F. Clarkson)

SHOT HOLE (Phyllosticta circumcissa) was moderate at Morden, and severe on some shoots at Brandon, Man.

BROWN ROT (Sclerotinia americana) was moderate on Peach Plum and Washington varieties at the Station, Sidney, B.C. Diseased fruits were sent from Outlook, Sask. Brown rot was exceedingly troublesome on peaches and susceptible varieties of plums during the past season. Unsprayed plum trees were observed on which over 70% of the fruits were rotted. Many baskets of peaches in transit to market were also destroyed (J. E. Howitt). Overwintered mummies on plum trees at Macdonald College, Que., produced the conidial stage in the spring (I. H. Crowell). Brown rot was affecting up to 15% of the fruit in a large commercial orchard near Moncton, N.B. in August.

PLUM POCKETS (Taphrina Pruni) was general and rather severe from eastern Ontario to P.E.I. in small unsprayed orchards.

SPRAY INJURY. Severe foliage injury was encountered in two orchards in Lincoln Co., Ont., from the use of lime sulphur 1-40, as a result of previous heavy rains and succulence of growth.

PRUNE

PRUNE MOSAIC (virus) was severe on one old Italian prune at Dog Lake, near Penticton, B.C. in 1938; slight symptoms were seen in 1940 in one adjacent tree that was normal in 1938 and 1939. The virus was successfully transmitted by top grafting from the diseased prune to 2 young prunes. Typical symptoms developed in 1940 from grafts made in the spring of 1939. Definite symptoms on peach, unlike those of any other peach disease resulted on the current season's growth when the trees were similarly top-grafted. (T. B. Lott) See p. 79 for its occurrence on peach.

RASPBERRY

DIE BACK (Armillaria mellea). Several plants were dying or dead in a new planting of Cuthbert in a low moist area at Hatzic, B.C. It also caused the death of individual plants in a few other plantings. (W. Jones)

SPUR BLIGHT (Didymella applanata) was general but the damage very slight on the Lower Mainland and Vancouver Island, B.C. Infection was heavy with extensive cane lesions in a nursery planting of Starlight in Ontario Co., Ont. Spur blight was very prevalent in most plantings in N.B. The disease was present in small amounts in many plantations in P.E.I.

ANTHRACNOSE (Elsinoe veneta) severely infected Lloyd George and Taylor, two very susceptible varieties, in a nursery in Elgin Co., Ont.

CANE BLIGHT (Leptosphaeria Coniothyrium) caused slight damage in a few Cuthbert plantings on the Lower Mainland, B.C.

YELLOW RUST (Phragmidium Rubi-idaei) was general on susceptible varieties, such as Cuthbert and Viking on the Lower Mainland and to a lesser extent on Vancouver Island, B.C. The damage was slight compared to previous years. The new variety, Winona, appears to be very susceptible.

CROWN GALL (Phytomonas tumefaciens) was severe in a ¼ acre planting at Boucherville, Que.; at least 30% of the plants were showing galls (E. Lavallee). Two plants were slightly affected in Queens Co., P.E.I.

LATE RUST (Pucciniastrum americanum). Most plantings of the Viking variety inspected in September or October were generally infected in Lincoln Co., Ont., and resulted in defoliation of the lower leaves. The canes, however, had made good growth and damage was negligible. The disease was also found on Latham, but to a lesser extent (G. C. Chamberlain). A considerable portion of the berries grown in the Renfrew district were unfit for sale on account of rust (F. Q. Dench). This rust attacked 20-75% of the berries and caused severe damage in one large planting of Viking and Newman in York Co., N.B.; it was not found elsewhere (S. F. Clarkson). A severe outbreak caused partial defoliation and marked 50% of the berries

at Hebron, N.S. (J. F. Hockey). A moderate attack occurred this year and severely damaged late berries in a Viking plantation in Queens Co., P.E.I.

LEAF SPOT (Septoria Rubi). Herbert was almost completely defoliated in a planting in Elgin Co., Ont., in mid-September. Viking was also heavily infected, but with considerable less defoliation (G. C. Chamberlain). Leaf spot was heavy in a planting at St. George, N.B. (J. L. Howatt)

POWDERY MILDEW (Sphaerotheca Humuli). A light infection occurred on Starlight at the Station, Summerland, B.C.; Lloyd George and other varieties were entirely free (M. F. Welsh). Powdery mildew was found in Latham plantings in nurseries in Lincoln Co., Ont. The canes were stunted and the terminal growth spindly. One planting of Viking adjacent to Latham showed scattered infections. It was of no importance in commercial plantings this year. (G. C. Chamberlain)

VERTICILLIUM WILT (V. sp.). A small area was slightly affected in a Viking nursery located in Lincoln Co., Ont. In the area the ground was low and poorly drained. In a fruiting plantation of Viking and Cuthbert, 3% of the canes were affected. (G. C. Chamberlain)

LEAF CURL (virus). Traces were seen in scattered plantations of Cuthbert in the Niagara Peninsula, Ont. (G. C. Chamberlain). Leaf curl was common on Viking raspberry in York, Sunbury, and Queens counties, N.B. It was also common on wild raspberry. (D. J. MacLeod)

MOSAIC (virus) is widely distributed in all parts of B.C. in numerous varieties; percentage of infected plants ranges from 3 to 80% and averages 20% (W. Jones). No mosaic was seen in the red raspberries at the Station, Summerland, B.C., but most plants of Sodus purpleberry in a 100 ft. row appeared slightly affected by a virus disease (H. R. McLarty). Most nursery plantings of Cuthbert, Viking, and Latham showed a trace to 30% of affected plants in Ont. Several Latham plantings were rejected for certification on account of mosaic. A high percentage of mosaic-affected plants was found in a planting of Chief, an unusual occurrence in Ont. Mosaic was also found in Taylor, but the percentage of affected plants was low (G. C. Chamberlain). Mosaic was very prevalent and quite destructive in some plantations in York Co., N.B. (S. F. Clarkson). In a planting in Queens Co., P.E.I., mosaic affected 2% of the Viking plants, 35% of Cuthbert, and 14% of Bomforth Seedling. (R. R. Hurst)

YELLOW BLOTCH CURL (virus). A small percentage of the plants was affected in several Cuthbert nursery plantings in Ont.; one planting could not be certified. The disease was also found in the Taylor variety. (G. C. Chamberlain)

POTASH DEFICIENCY was rather severe on Viking in a planting at Charlottetown, P.E.I. (R. R. Hurst)

SAND CHERRY

BROWN ROT (Sclerotinia americana) destroyed one third of the fruit in a planting at Luseland, Sask. Fruit and spur blight was severe at Morden, Man.

STRAWBERRY

FRUIT DECAY (Botrytis and Rhizopus) caused a loss of 30% of the fruit in 2 fields of Marshall, of 40 acres extent, on Lulu Island, B.C. The berries were attacked while they were still green. The fruit was hidden under profuse top foliage and the weather was very humid at the time. (W. Jones)

GREY MOULD (Botrytis sp.) was found in many plantations in Lincoln Co. Rank growth of plants and very wet conditions, which interfered with the harvesting of the fruit favoured disease development (G. C. Chamberlain). Traces were present at Macdonald College, Que., in Queens Co., N.B., and in P.E.I. Fruit from Arkansas was heavily infected when examined in Montreal.

LEAF SCORCH (Diplocarpon Earliana (Marsonnina Fragariae) was slight on British Sovereign and Horne at the Farm, Agassiz, B.C., and moderate on British Sovereign and Louise at the Station, Sidney. In commercial plantings, the disease was general on British Sovereign, but damage was only slight (W. Jones). Leaf scorch was severe in a planting of Howard's Supreme in Lincoln Co., Ont.

LEAF SPOT (Mycosphaerella Fragariae (Ramularia Tulasnei) was severe on the Simcoe variety, moderate on Borden, Laurier, Louise, and Bowell, and absent on Cartier, Abbot, Lavergne, Herman, and King at the Farm, Agassiz, B.C. It was also more severe on Simcoe than on other varieties at the Station, Sidney, B.C. The damage is negligible in commercial crops (W. Jones). Leaf spot was common throughout the Montreal district, Que., but it appears to cause no appreciable damage (E. Lavallee). The disease was common in N.B.; severe infections occurred in a few plantings at Douglas and Keswick Ridge (S. F. Clarkson). At Kentville, N.S., conidial production was slight throughout the growing season, except for a slight increase on the current season's foliage during moist weather in September (R. J. Baylis). Leaf spot was severe on Senator Dunlop, and moderate on Laurier and Agnes at Charlottetown, P.E.I. Some injury was apparent on Senator Dunlop. (R. R. Hurst)

BROWN ROT (Rhizoctonia Solani). A sample crate sent for examination from a shipment received in Montreal from Alabama was completely ruined by infection with Rhizoctonia. (I. H. Crowell)

FRUIT DECAY (Sclerotinia sclerotiorum). Sclerotia were found on the fruit of only a few plants of the Marshall strawberry on Lulu Island,

B.C. The organism was identified from a sub-culture as Sclerotinia sclerotiorum by F. L. Drayton. (W. Jones)

POWDERY MILDEW (Sphaerotheca Humuli)was exceptionally heavy in an acre field at Iberville, Que. causing a noticeable reduction of the crop. It was also reported in a few fields in Vaudreuil Co. (E. Lavallee). Powdery mildew was first observed in the variety trial plots at Kentville, N.S., on Aroma on June 11, and it spread subsequently to most of the varieties. On June 17, the disease was severe on Aroma, Edward and Nichomas; heavy on Charles; moderate on Senator Dunlop, Robert, Simcoe, John and Lemieux; and light on Jim, King, Magee, Cartier, Walter, Ralph, Macdonald, and Horace. In addition, infection was light on Premier at Berwick and heavy on Senator Dunlop at Debert (D. Creelman and J. F. Hockey). In the test plots, at Charlottetown, P.E.I. powdery mildew was estimated to be severe on Henry, King, Edward, Senator Dunlop, Macdonald, Cartier and Simcoe; moderate on Lilian, Claire, Paul, Walter, Martha, Lavergne, and Herman, and slight on Jim, Ralph, Horace, Agnes, Florence, Bowell, Tupper, Clarabell, McKenzie, John, Louis, and Charles. (R. R. Hurst)

CRINKLE (virus). Two affected plants were found in a planting in Carleton Co., N.B. (D. J. MacLeod)

MOSAIC (virus) affected 1% of Senator Dunlop plants in a planting near Charlottetown, P.E.I. (R. R. Hurst)

WITCHES' BROOM (virus) was found affecting several plants of Premier in a fruiting plantation at Berwick, N.S.; the disease was identified by Dr. Hildebrand. Some affected plants were rogued from clonal line nursery plantings. (J. F. Hockey)

YELLOWS (virus) moderately affected Blackmore at Macdonald College, Que. (I. H. Crowell)

ROOT ROT or BLACK ROOT (cause unknown) caused considerable damage in some plantings on Vancouver Island and the Lower Mainland, B.C. (W. Jones). The disease is apparently increasing in destructiveness in N.B.; it is very prevalent in the Grand Lake area. (S. F. Clarkson)

SCORCH (potash deficiency) was quite common in two plantations of Senator Dunlop, one at Montague and the other at Charlottetown, P.E.I.

YOUNGBERRY

LEAF SPOT (Mycosphaerella Rubi) was general and caused slight damage at the Station, Sidney, B.C.